PATENT ABSTRACTS OF JAPAN

| (51)Int.Cl. | G06F 3/06 |
	G06F 3/00
	G06F 13/12
	G06F 13/38

(54) INTERFACE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To easily connect both of a mass-storage device conforming to an ATA/ATAPI interface specifications and a memory card conforming to an ATA interface specifications to a computer.

SOLUTION: This interface device is provided with a controller removably connected to the computer via a USB bus and converting a USB interface specification-conforming command outputted from the computer into an ATA/ ATAPI interface specification-conforming command, a first connector connected to the controller via the ATA bus for removably connecting the storage device conforming to the ATA/ATAPI interface specifications, and a second connector connected to the controller via the ATA bus for removably connecting the memory card receiving a predetermined selection signal fed from the controller and conforming to the ATA interface specifications.
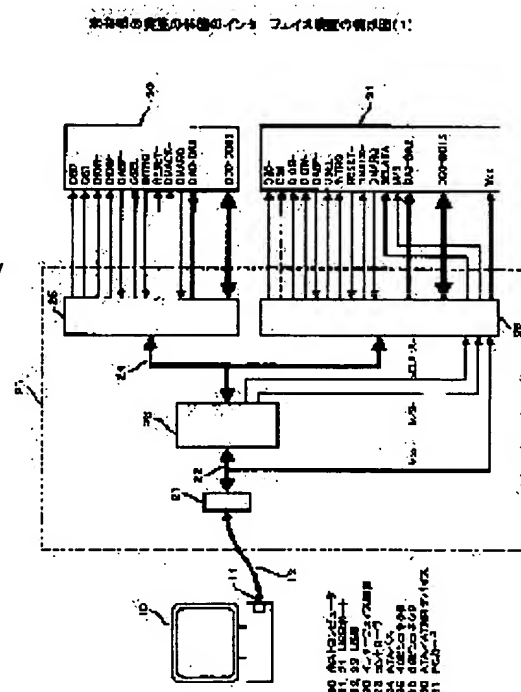
LEGAL STATUS

[Date of request for examination]

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[Patent number]

[Date of registration]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the interface device which connects to a host computer the large capacity storage especially based on ATA/ATAPI interface specification, and the memory card based on ATA interface specification about the interface device which connects a peripheral device with a host computer.
[0002]
[Description of the Prior Art] Although there are hard disk drive equipment, CD-ROM drive equipment, MO drive equipment, etc. in the large capacity storage of a personal computer, hard disk drive equipment operates based on ATA (AT Attachment) interface specification, and CD-ROM drive equipment and MO drive equipment operate based on the ATAPI (AT Attachment Packet Interface) interface specification which extended ATA interface specification.
[0003] In addition, only by a part of signals differing, since the pin out of a connector is the same, ATA interface specification and ATAPI interface specification are usually named ATA/ATAPI interface specification generically.
[0004] The usage which direct continuation is carried out to the internal bus of a host computer, it is not operated with carrying-izing of information machines and equipment in recent years, and installation and removal operate as an easy external device is increasing such hard disk drive equipment, CD-ROM drive equipment, etc.
[0005] For example, the proposal which connects a host computer and the hard disk drive equipment based on ATA/ATAPI interface specification to the computer interface device of JP,11-119878,A with a USB (Universal Serial Bus) interface is made.
[0006] On the other hand, the PC card is widely used for the notebook computer as external storage with easy installation and removal. However, since a PC card needs the PC Card slot of dedication, when using a PC card with a desktop computer without a PC Card slot, it has connected the desktop computer and PC card reader writer with a USB interface.
[0007] Although these PC cards operate based on a PC card standard, in order to operate a PC card as an external hard disk in recent years, the PC card (ATA card) which operates based on ATA interface specification has spread. In connection with this, the demand of wanting to use both CD-ROM etc. and PC card became strong as external memory of a host computer.
[0008] Drawing 9 is an explanatory view of the conventional connection method which connects both CD-ROM and PC card to a host computer. When both CD-ROM and PC card were used as external memory of a host computer, for example, as shown in drawing 9 , USB hub 60 was connected with the host computer 10 by the USB cable 61, and PC card reader writer 63 which equipped with USB hub 60, CD-ROM drive equipment 62, and PC card 64 further was connected with the USB cable 61.
[0009]
[Problem(s) to be Solved by the Invention] Thus, it was very inconvenient, when must prepare USB hub 60 and PC card reader writer 63, and USB hub 60 must be connected with a host computer 10 by the USB cable 61, when using both CD-ROM etc. and PC card as external memory of a host computer, USB hub 60, CD-ROM drive equipment 62, and PC card reader writer 63 had to be further connected by the USB cable 61 and it used it at a going-out place etc.
[0010] Moreover, since the hard disk was built in in housing in the computer interface device indicated by JP,11-119878,A, it was difficult to exchange a hard disk for other storage, such as CD-ROM, or to use it with a PC card.
[0011] Then, the object of this invention is to offer the interface device which can connect both large capacity storage based on ATA / ATAPI interface specification, and memory card based on ATA interface specification to a host computer simple.
[0012]
[Means for Solving the Problem] In order to attain the above-mentioned object, one side face of this invention The

·command based on the general-purpose bus interface specification which is connected with a computer by the general-purpose bus removable, and is outputted from a computer The controller changed into the command based on ATA/ATAPI interface specification, The 1st connector to which an ATA bus connects with a controller and the storage based on ATA/ATAPI interface specification is connected removable, It is characterized by having the 2nd connector to which an ATA bus connects with a controller and the memory card further based on the ATA interface specification that a predetermined selection signal is supplied from a controller is connected removable.

[0013] According to this invention, it can connect easily [a computer], the storage based on ATA/ATAPI interface specification, such as CD-ROM drive equipment, and two external storage of the memory card based on ATA interface specification can be controlled, and the handling in a going-out place etc. becomes very easy.

[0014] Moreover, the 1st and the 2nd connector are characterized by being arranged and prepared in one field of an interface device as a desirable mode of the above-mentioned invention.

[0015] According to this invention, the storage based on ATA/ATAPI interface specification and the memory card based on ATA interface specification can be installed in piles. Therefore, the installation area of the whole external storage linked to a computer becomes small, and the installation in a narrow location becomes very easy.

[0016] Moreover, an interface device consists of the 1st adapter containing a controller and the 1st connector, and the 2nd adapter containing the 2nd connector as a desirable mode of the above-mentioned invention, and the 1st and the 2nd adapter are characterized by the 3rd connector connecting removable.

[0017] According to this invention, according to the class and number of the external storage linked to a computer, each external storage can be connected simple and the handling in the case of connecting external storage with a computer becomes very easy.

[0018] In order to attain the above-mentioned object, another side face of this invention The command based on the general-purpose bus interface specification which is connected with a computer and a computer by the general-purpose bus, and is outputted from a computer The controller changed into the command based on ATA/ATAPI interface specification, The storage based on the ATA/ATAPI interface specification connected with a controller by the ATA bus, An ATA bus connects with a controller and it is characterized by having the memory card further based on the ATA interface specification that a predetermined selection signal is supplied from a controller.

[0019] Moreover, one of the embodiments of this invention is an interface device which sets said general-purpose bus to USB. Moreover, another embodiment is an interface device which makes said general-purpose bus IEEE1394 (Institute of Electrical and Electronic Engineers 1394). Moreover, another embodiment is SCSI (Small Computer System Interface) about said general-purpose bus. It is the interface device to carry out. Moreover, another embodiment is an interface device which uses said general-purpose bus as a parallel interface.

[0020] According to this invention, to a computer, it can connect easily and the storage based on ATA/ATAPI interface specification, such as CD-ROM drive equipment, and two external storage of the memory card based on ATA interface specification can be controlled.

[0021]
[Embodiment of the Invention] Hereafter, with reference to a drawing, the example of a gestalt of operation of this invention is explained. However, the example of a gestalt of this operation does not limit the technical range of this invention.

[0022] Drawing 1 is the block diagram of the interface device of the gestalt of operation of this invention. The interface device 20 of the gestalt of this operation has the USB port 21 connected to the USB port 11 of a host computer 10 by the USB cable 12, the controller 23 which changes the command of USB interface specification into the command of ATA/ATAPI interface specification, 40 pin connectors 25 based on ATA / ATAPI interface specification, and 68 pin connectors 26 based on ATA / ATAPI interface specification.

[0023] The USB port 21 and a controller 23 are connected by USB22, and the power source Vcc which is a part of USB22 is supplied also to 68 pin connectors 26. Moreover, a controller 23, 40 pin connectors 25, and 68 pin connectors 26 are connected by ATA bus 24, and ATA selection-signal SELATA- and master slave signal M/S- are supplied to 68 pin connectors 26 from a controller 23.

[0024] Moreover, the ATA/ATAPI devices 30, such as CD-ROM drive equipment, are connected to 40 pin connectors 25, and the memory card 31 based on ATA interface specification, for example, a PC card, is connected to 68 pin connectors 26 at them.

[0025] The signal specification of 40 pin connectors 25 based on ATA/ATAPI interface specification at drawing 2 is shown. 40 pin connectors 25 connect with the ATA bus 24, and the external storage based on ATA/ATAPI interface specification, such as hard disk drive equipment and CD-ROM drive equipment, is controlled.

[0026] Moreover, the signal specification of 68 pin connectors 26 based on ATA/ATAPI interface specification at

drawing 3 is shown. It connects with 68 pin connectors 26 to which the signal for operating each signal and PC card 31 of the ATA bus 24 as a hard disk is supplied, and PC card 31 based on ATA interface specification is controlled.

[0027] In the interface device 20 of the gestalt of this operation, as shown in drawing 1, ATA selection-signal SELATA-, master slave signal M/S-, and the power source Vcc of USB22 are added to each signal of 40 pin connectors 25 which constitute the ATA bus 24, and it is considering as the signal of 68 pin connectors 26.

[0028] By ATA/ATAPI interface specification, by making ATA selection-signal SELATA- of 68 pin connectors 26 into negative logic, PC card 31 can be operated in true IDE mode, and can be dealt with as an ATA device equivalent to hard disk drive equipment.

[0029] Moreover, it is controllable as an ATA device which became independent, respectively about two ATA devices which could set PC card 31 as the drive 0 (master) or the drive 1 (slave), and were connected on the ATA bus 24 by master slave signal M/S-. In addition, the ATA device to access is chosen by making Bit4 (DevBit) of the device / head register of each ATA device into H level or L level.

[0030] However, master slave signal M/S- is not changed by the controller 23, but the switch which changes master slave signal M/S- to H level or L level can be formed in an interface device 20, and PC card 31 can also be set as it with this switch at drive 0 or drive 1.

[0031] In addition, although they are for detecting whether the PC card is inserted, since signal CD1- of 36 pins of 68 pin connectors shown in drawing 3 and 67 pins and CD2- can perform detection of a PC card by whether a PC card is accessed actually and there is any response, they are not especially required.

[0032] Thus, according to the interface device 20 of the gestalt of this operation, two external storage of PC card 31 based on the ATA/ATAPI device 30 and ATA interface specification, such as CD-ROM drive equipment, can be connected and controlled to a host computer 10 at juxtaposition, and the handling in a going-out place etc. becomes very easy.

[0033] Drawing 4 is structural drawing (1) of the interface device of the gestalt of operation of this invention. The USB port 21 where the interface device 20 of the gestalt of this operation is connected to a host computer 10, 40 pin connectors 25 connected to the ATA/ATAPI device 30, and 68 pin connectors 26 connected to PC card 31 are constituted by one. In addition, 40 pin connectors 25 and 68 pin connectors 26 are countered and formed in the side face of right and left of equipment.

[0034] The interface device 20 of the gestalt of this operation receives the command of the USB interface specification outputted by the USB port 21 from a host computer 10. The command of USB interface specification is changed into the command of ATA/ATAPI interface specification by the controller in an interface device 20, and is outputted to the ATA/ATAPI device 30 and PC card 31 from 40 pin connectors 25 and 68 pin connectors 26.

[0035] Thus, according to the interface device 20 of the gestalt of this operation, it can connect simple, two external storage of PC card 31 based on the ATA/ATAPI device 30 and ATA interface specification, such as CD-ROM drive equipment, can be controlled, and the handling in a going-out place etc. is very easy.

[0036] Moreover, the interface device 20 of the gestalt of this operation is easy for interconnection cables, such as a USB cable, to become unnecessary and to install in a narrow location by 40 pin connectors 25 and 68 pin connectors 26 which were prepared in the side face on either side, since the direct continuation of the ATA/ATAPI device 30 and PC card 31 can be carried out.

[0037] Drawing 5 is structural drawing (2) of the interface device of the gestalt of operation of this invention. Like the gestalt of operation of drawing 4, although the USB port 21, 40 pin connectors 25, and 68 pin connectors 26 are constituted by one, 40 pin connectors 25 and 68 pin connectors 26 are formed by the interface device 20 of the gestalt of this operation up and down together with one side face of equipment.

[0038] According to the interface device 20 of the gestalt of this operation, PC card 31 can be installed in piles on the ATA/ATAPI devices 30, such as CD-ROM drive equipment. Therefore, the installation area of the whole external storage linked to a host computer 10 becomes small, and the installation in a narrow location is very easy.

[0039] Drawing 6 is structural drawing (3) of the interface device of the gestalt of operation of this invention. The interface device 20 of the gestalt of this operation is divided into the conversion adapter 40 which has the USB port 21 and 40 pin connectors 25, and the conversion adapter 42 which has 68 pin connectors 26, and the conversion adapter 40 and the conversion adapter 42 are connected by the internal connector 41.

[0040] Each signal of the ATA bus 24, a power source Vcc and ATA selection-signal SELATA-, and master slave signal M/S- are supplied to the internal connector 41. The internal connector 41 has composition which can connect 40 pin connectors 25, and can output each signal of the ATA bus 24 to 40 pin connectors 25.

[0041] According to the interface device 20 of the gestalt of this operation, according to the class and number of the external storage linked to a host computer 10, each external storage is connectable simple. For example, what is necessary is to prepare only the conversion adapter 40, if only one ATA / ATAPI devices 30, such as CD-ROM drive equipment, are

·connected to a host computer 10.

[0042] Moreover, if other ATA/ATAPI devices 30 are connected to the internal connector 41 of the conversion adapter 40, two ATA/ATAPI devices 30 are connectable with a host computer 10.

[0043] Drawing 7 is structural drawing (4) of the interface device of the gestalt of operation of this invention. The interface device 20 of the gestalt of this operation is divided into the conversion adapter 52 which has the conversion adapter 50 which has the USB port 21, and 40 pin connectors 25 and 68 pin connectors 26, and the conversion adapter 50 and the conversion adapter 52 are connected by the internal connector 51.

[0044] Each signal of the ATA bus 24, a power source Vcc and ATA selection-signal SELATA-, and master slave signal M/S- are supplied to the internal connector 51. The internal connector 51 has composition which can connect 40 pin connectors 25, and can output each signal of the ATA bus 24 to 40 pin connectors 25.

[0045] Also in the interface device 20 of the gestalt of this operation, each external storage is connectable simple according to the class and number of the external storage linked to a host computer 10.

[0046] For example, what is necessary is to prepare only the conversion adapter 50 and just to connect the ATA/ATAPI device 30 to the internal connector 51, if only one ATA/ATAPI devices 30, such as CD-ROM drive equipment, are connected to a host computer 10.

[0047] Drawing 8 is structural drawing (5) of the interface device of the gestalt of operation of this invention. As for the interface device 20 of the gestalt of this operation, the USB cable 12, 40 pin connectors 25, and 68 pin connectors 26 are constituted by one. And the USB cable 12 is connected to the USB port 11 of a host computer 10, and 40 pin connectors 25 and 68 pin connectors 26 are connected to the ATA/ATAPI device 30 and PC card 31, respectively.

[0048] According to the interface device 20 of the gestalt of this operation, since the USB cable 12, 40 pin connectors 25, and 68 pin connectors 26 are constituted by one, it is very easy to connect the ATA/ATAPI device 30 and PC cards 31, such as CD-ROM drive equipment, to a host computer 10.

[0049] In drawing 1 of the gestalt of said operation, although it had the controller 23 which an interface device 20 is connected to the USB port 11 of a host computer 10 by the USB cable 12, and changes the command of USB interface specification into the command of ATA/ATAPI interface specification, an interface device is connected to the IEEE1394 port of a host computer by IEEE1394, and you may have the controller which changes the command of IEEE1394 interface specification into the command of ATA/ATAPI interface specification. The configuration in that case is shown in drawing 10.

[0050] Moreover, in drawing 1 of the gestalt of said operation, although it had the controller 23 which an interface device 20 is connected to the USB port 11 of a host computer 10 by the USB cable 12, and changes the command of USB interface specification into the command of ATA / ATAPI interface specification, an interface device is connected to the SCSI port of a host computer by SCSI, and you may have the controller which changes the command of SCSI interface specification into the command of ATA / ATAPI interface specification. The configuration in that case is shown in drawing 11.

[0051] In this case, since a power source Vcc is not supplied to a memory card from a host computer, it becomes possible from an interface device 20 to connect a memory card by supplying a power source Vcc.

[0052] Moreover, in drawing 1 of the gestalt of said operation, although it had the controller 23 which an interface device 20 is connected to the USB port 11 of a host computer 10 by the USB cable 12, and changes the command of USB interface specification into the command of ATA / ATAPI interface specification, an interface device is connected to the parallel port of a host computer by parallel, and you may have the controller which changes the command of parallel interface specification into the command of ATA/ATAPI interface specification. The configuration in that case is shown in drawing 12.

[0053] In this case, since a power source Vcc is not supplied to a memory card from a host computer, it becomes possible from an interface device 20 to connect a memory card by supplying a power source Vcc.

[0054] Although it had 40 pin connectors 25 based on ATA / ATAPI interface specification, and 68 pin connectors 26 based on ATA/ATAPI interface specification with the gestalt of said operation, 40 pin connectors 25 based on ATA/ATAPI interface specification may be made into 44 pin connectors based on ATA/ATAPI interface specification. In this case, it becomes possible from an interface device 20 to connect the ATA/ATAPI interface device 30 by supplying a power source Vcc.

[0055] Moreover, 68 pin connectors 26 based on ATA/ATAPI interface specification may be made into 50 pin connectors based on CF+and CompactFlash interface specification. The configuration in that case is shown in drawing 13.

[0056] In this case, also by CF+and CompactFlash interface specification, by making ATA selection-signal SELATA- of 50 pin connectors into negative logic, a memory card can be operated in true IDE mode, and it can be dealt with as an ATA device equivalent to hard disk drive equipment. Moreover, it can be set as drive 0 (master) or drive 1 (slave) by

cable select signal CSEL.

[0057] The protection range of this invention is not limited to the gestalt of the above-mentioned operation, but attains to invention indicated by the claim and its equal object.

[0058]

[Effect of the Invention] As mentioned above, according to this invention, it can connect easily [a computer], the storage based on ATA/ATAPI interface specification, such as CD-ROM drive equipment, and two external storage of the memory card based on ATA interface specification can be controlled, and the handling in a going-out place etc. becomes very easy.

[0059] Moreover, according to this invention, the storage based on ATA / ATAPI interface specification and the memory card based on ATA interface specification can be installed in piles, the installation area of the whole external storage linked to a computer becomes small, and the installation in a narrow location becomes very easy.

[0060] Furthermore, according to this invention, according to the class and number of the external storage linked to a computer, each external storage can be connected simple and the handling in the case of connecting external storage with a computer becomes very easy.

[Translation done.]

CLAIMS

[Claim(s)]
[Claim 1] The command based on the general-purpose bus interface specification which is connected with a computer by the general-purpose bus removable, and is outputted from this computer The controller changed into the command based on ATA/ATAPI interface specification, The 1st connector to which an ATA bus connects with this controller and the storage based on ATA / ATAPI interface specification is connected removable, The interface device characterized by having the 2nd connector to which this ATA bus connects with this controller, and the memory card further based on the ATA interface specification that a predetermined selection signal is supplied from this controller is connected removable.
[Claim 2] The interface device with which said general-purpose bus is characterized by being USB in claim 1.
[Claim 3] The interface device with which said general-purpose bus is characterized by being IEEE1394 in claim 1.
[Claim 4] The interface device with which said general-purpose bus is characterized by being SCSI in claim 1.
[Claim 5] The interface device with which said general-purpose bus is characterized by being a parallel interface in claim 1.
[Claim 6] It is the interface device which said 1st connector is a connector based on ATA/ATAPI interface specification in claim 1, and is characterized by said 2nd connector being 68 pin connectors based on ATA interface specification.
[Claim 7] It is the interface device which said 1st connector is a connector based on ATA/ATAPI interface specification in claim 1, and is characterized by said 2nd connector being 50 pin connectors based on CF+and CompactFlash interface specification.
[Claim 8] It is the interface device characterized by arranging said the 1st and 2nd connector in one field of said interface device in claim 1, and being prepared.
[Claim 9] in claim 1, said interface device consists of the 1st adapter containing said controller and said 1st connector, and the 2nd adapter containing said 2nd connector -- having -- this -- the interface device characterized by the 1st and the 2nd adapter being connected by the 3rd connector removable.
[Claim 10] in claim 1, said interface device consists of the 1st adapter containing said controller, and the 2nd adapter containing said 1st and 2nd connectors -- having -- this -- the interface device characterized by the 1st and the 2nd adapter being connected by the 3rd connector removable.
[Claim 11] It is the interface device characterized by the ability to set said PC card by which said selection signal was connected to said 2nd connector in claim 1 as the drive 0 or drive 1 in ATA interface specification.
[Claim 12] The command based on the general-purpose bus interface specification which is connected with a computer and this computer by the general-purpose bus, and is outputted from this computer The controller changed into the command based on ATA/ATAPI interface specification, The storage based on the ATA/ATAPI interface specification connected with this controller by the ATA bus, The computer system which is connected with this controller by this ATA bus, and is further characterized by having a memory card based on the ATA interface specification that a predetermined selection signal is supplied from this controller.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram (1) of the interface device of the gestalt of operation of this invention.
[Drawing 2] It is the signal specification of 40 pin connectors of an ATA/ATAPI interface.
[Drawing 3] It is the signal specification of 68 pin connectors of an ATA/ATAPI interface.
[Drawing 4] It is structural drawing (1) of the interface device of the gestalt of operation of this invention.
[Drawing 5] It is structural drawing (2) of the interface device of the gestalt of operation of this invention.
[Drawing 6] It is structural drawing (3) of the interface device of the gestalt of operation of this invention.
[Drawing 7] It is structural drawing (4) of the interface device of the gestalt of operation of this invention.
[Drawing 8] It is structural drawing (5) of the interface device of the gestalt of operation of this invention.
[Drawing 9] It is the explanatory view of the conventional connection method.
[Drawing 10] It is the block diagram (2) of the interface device of the gestalt of operation of this invention.
[Drawing 11] It is the block diagram (3) of the interface device of the gestalt of operation of this invention.
[Drawing 12] It is the block diagram (4) of the interface device of the gestalt of operation of this invention.
[Drawing 13] It is the block diagram (5) of the interface device of the gestalt of operation of this invention.
[Description of Notations]
10 Host Computer
11 21 USB port
12 22 USB
20 Interface Device
23 Controller
24 ATA Bus
25 40 Pin Connectors
26 68 Pin Connectors
30 ATA / ATAPI Device
31 PC Card
40 42 Conversion adapter
41 Internal Connector

[Translation done.]

DRAWINGS

[Drawing 1]

本発明の実施の形態のインターフェイス装置の構成図（１）


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10  ホストコンピュータ
11, 21  USBポート
12, 22  USB
20  インターフェイス装置
23  コントローラ
24  ATAバス
25  40ピンコネクタ
26  68ピンコネクタ
30  ATA/ATAPIデバイス
31  PCカード
```
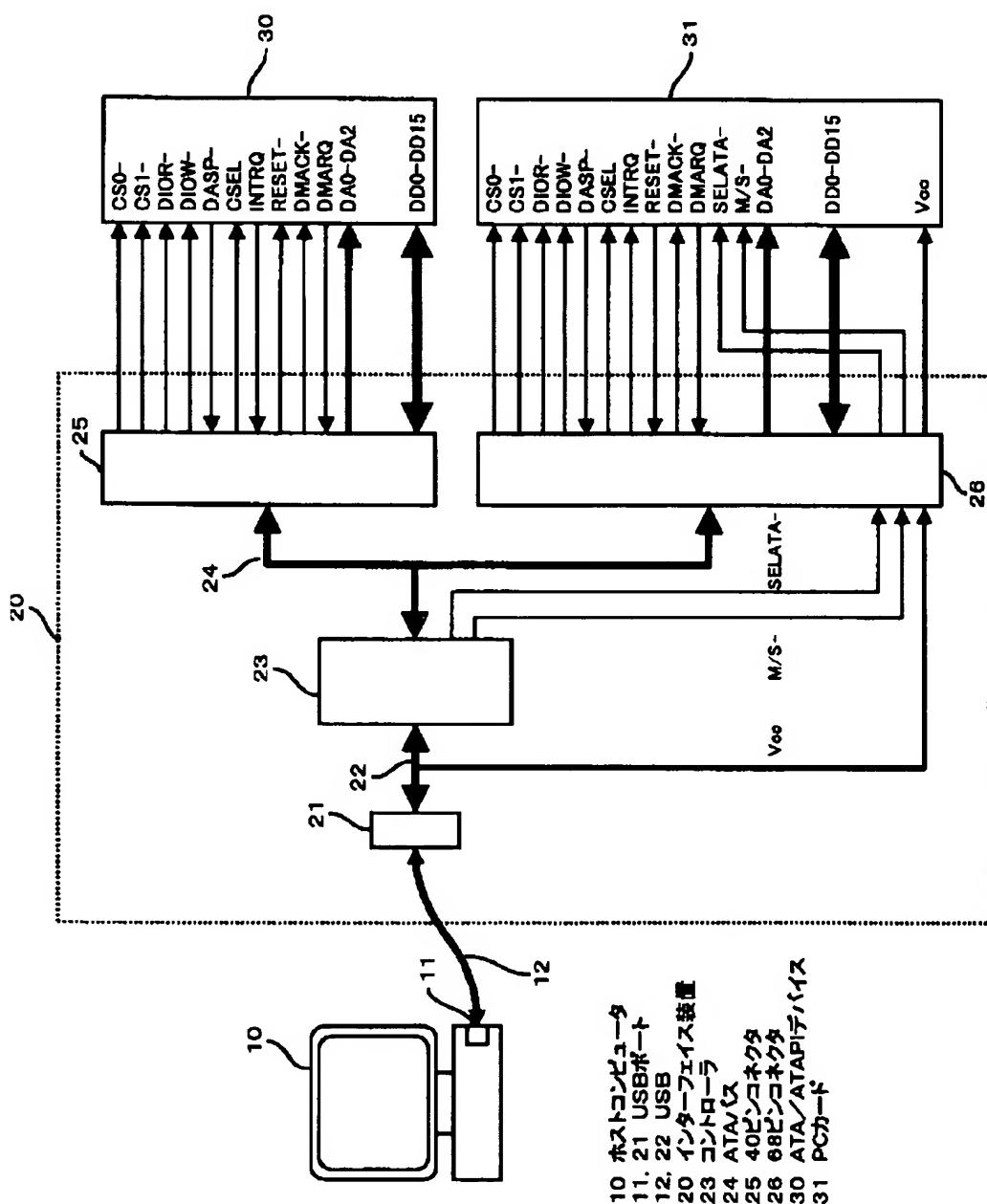
[Drawing 2]

ATA／ATAPIインターフェイスの40ピンコネクタの信号仕様

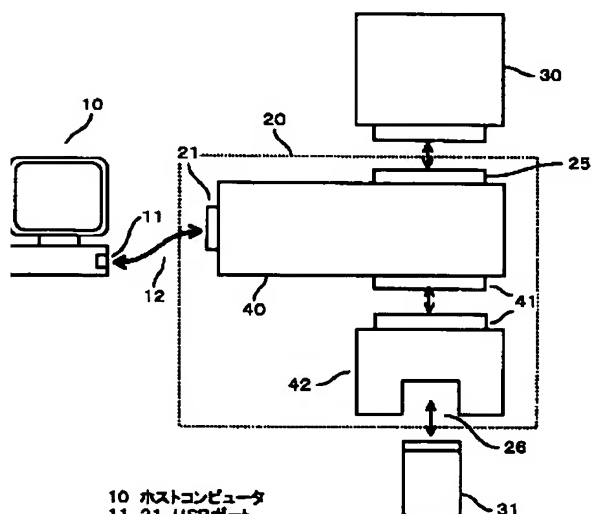| ピン番号	略称	信号名
1	RESET-	リセット
2	Ground	
3	DD7	データ・バス ビット7
4	DD8	データ・バス ビット8
5	DD6	データ・バス ビット6
6	DD9	データ・バス ビット9
7	DD5	データ・バス ビット5
8	DD10	データ・バス ビット10
9	DD4	データ・バス ビット4
10	DD11	データ・バス ビット11
11	DD3	データ・バス ビット3
12	DD12	データ・バス ビット12
13	DD2	データ・バス ビット2
14	DD13	データ・バス ビット13
15	DD1	データ・バス ビット1
16	DD14	データ・バス ビット14
17	DD0	データ・バス ビット0
18	DD15	データ・バス ビット15
19	Ground	
20	予約	(キー)
21	DMARQ	DMA リクエスト(オプション)
22	Ground	
23	DIOW-	I/O ライト
24	Ground	
25	DIOR-	I/O リード
26	Ground	
27	IORDY	I/O レディ(オプション)
28	SPSYNC:CSEL	スピンドル同期／ケーブル・セレクト(どちらもオプション)
29	DMACK-	DMA アクノリッジ(オプション)
30	Ground	
31	INTRQ	割り込みリクエスト
32	IOCS16-	16ビット I/O
33	DA1	デバイス・アドレス1
34	PDIAG-	自己診断終了
35	DA0	デバイス・アドレス0
36	DA2	デバイス・アドレス2
37	CS0-	チップ・セレクト0
38	CS1-	チップ・セレクト1
39	DASP-	デバイス・アクティブ／スレーブあり
40	Ground	

[Drawing 4]
本発明の実施の形態のインターフェイス装置の構造図(1)
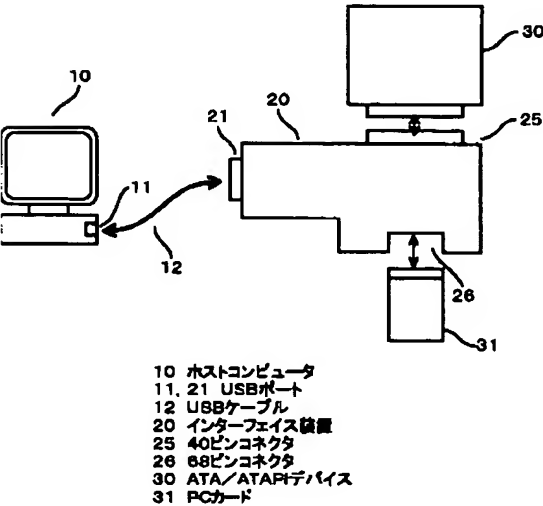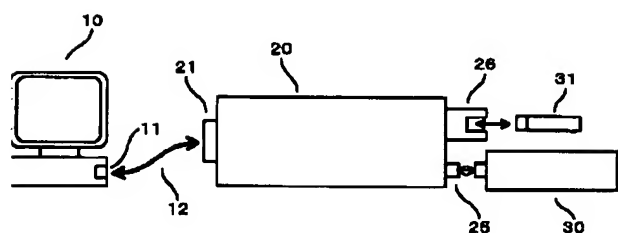
10 ホストコンピュータ
11, 21 USBポート
12 USBケーブル
20 インターフェイス装置
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード

[Drawing 5]

10 ホストコンピュータ
11，21 USBポート
12 USBケーブル
20 インターフェイス装置
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード

[Drawing 6]

本発明の実施の形態のインターフェイス装置の構造図（3）

10 ホストコンピュータ
11，21 USBポート
12 USBケーブル
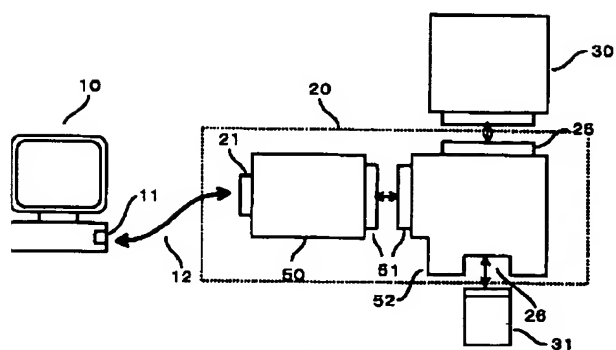20 インターフェイス装置
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード
40，42 変換アダプタ
41 内部コネクタ

[Drawing 3]

ATA／ATAPIインターフェイスの68ピンコネクタの信号仕様

| ピン番号	略 称	信 号 名
1	Ground	
2	DD3	データ・バス ビット3
3	DD4	データ・バス ビット4
4	DD5	データ・バス ビット5
5	DD6	データ・バス ビット6
6	DD7	データ・バス ビット7
7	CS0 -	チップ・セレクト0
8		（空き）
9	SELATA -	ATA選択
10		（空き）
11	CS1 -	チップ・セレクト1
12		（空き）
13		（空き）
14		（空き）
15		（空き）
16	INTRQ	割り込みリクエスト
17	Vcc	ロジック電源
18		（空き）
19		（空き）
20		（空き）
21		（空き）
22		（空き）
23		（空き）
24		（空き）
25		（空き）
26		（空き）
27	DA2	デバイス・アドレス2
28	DA1	デバイス・アドレス1
29	DA0	デバイス・アドレス0
30	DD0	データ・バス ビット0
31	DD1	データ・バス ビット1
32	DD2	データ・バス ビット2
33	IOCS16 -	16ビット I/O
34	Ground	
35	Ground	
36	CD1 -	カード検出
37	DD11	データ・バス ビット11
38	DD12	データ・バス ビット12
39	DD13	データ・バス ビット13
40	DD14	データ・バス ビット14
41	DD15	データ・バス ビット15
42	CS1 -	チップ・セレクト1
43		（空き）
44	DIOR -	I/Oリード
45	DIOW -	I/Oライト
46		（空き）
47		（空き）
48		（空き）
49		（空き）
50		（空き）
51	Vcc	ロジック電源
52		（空き）
53		（空き）
54		（空き）
55	M/S -	マスタ／スレーブ
56	CSEL	ケーブル・セレクト1
57		（空き）
58	RESET -	リセット
59	IORDY	I/Oレディ（オプション）
60	DMARQ	DMAリクエスト（オプション）
61	DMACK -	DMAアクノリッジ（オプション）
62	DASP -	デバイス・アクティブ／スレーブあり
63	PDIAG -	自己診断終了
64	DD8	データ・バス ビット8
65	DD9	データ・バス ビット9
66	DD10	データ・バス ビット10
67	CD2 -	カード検出
68	Ground	

[Drawing 7]

本発明の実施の形態のインターフェイス装置の構造図(4)

10 ホストコンピュータ
11, 21 USBポート
12 USBケーブル
20 インターフェイス装置
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード
50, 52 変換アダプタ
51 内部コネクタ

[Drawing 8]

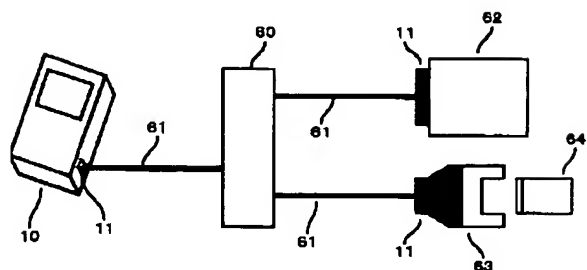本発明の実施の形態のインターフェイス装置の構造図(5)
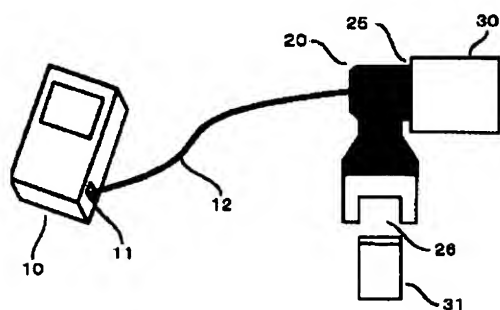
10 ホストコンピュータ
11 USBポート
12 USBケーブル
20 インターフェイス装置
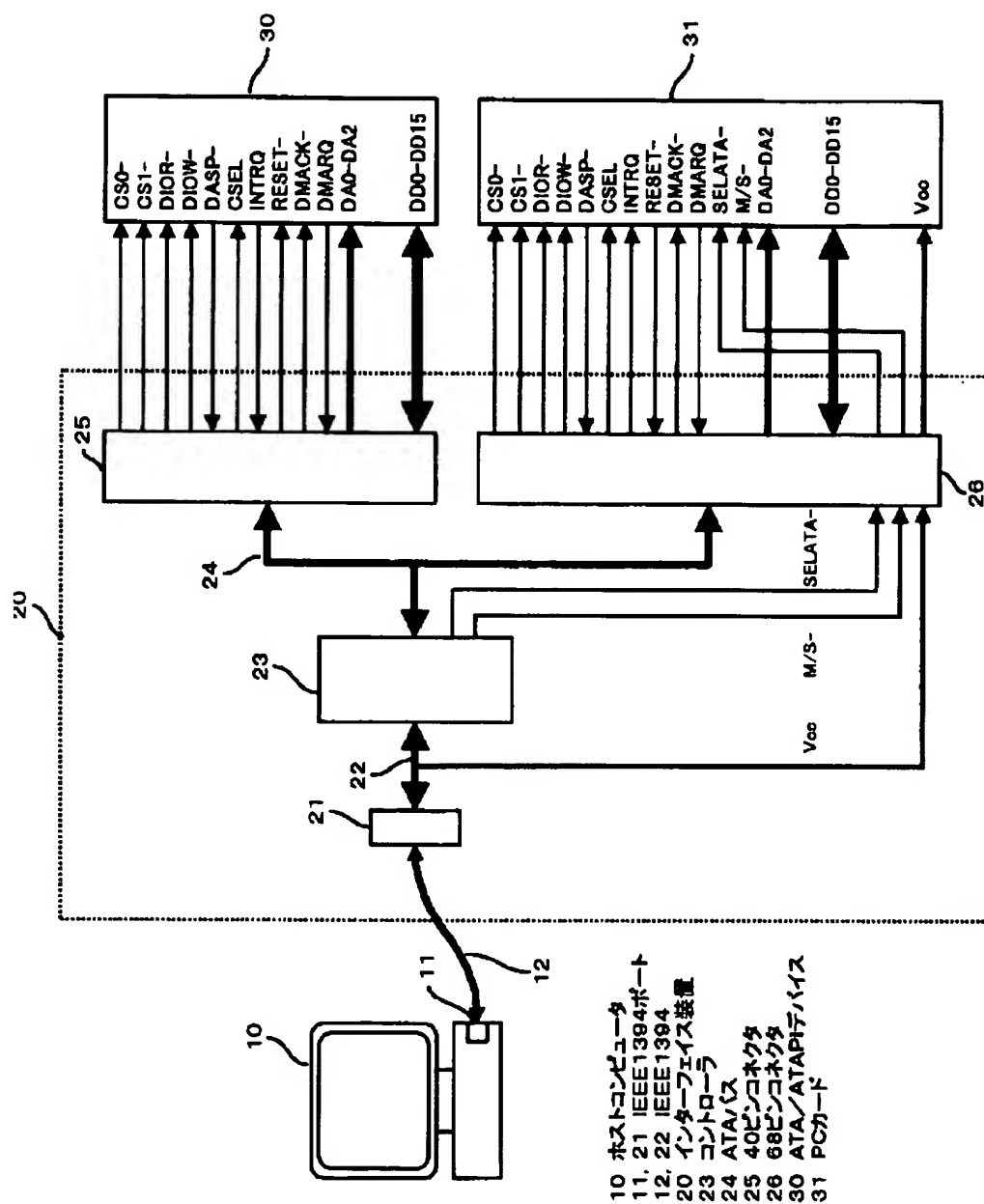25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード

[Drawing 9]

従来の接続方法の説明図

10 ホストコンピュータ
11 USBポート
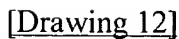60 USBハブ
61 USBケーブル
62 CD-ROMドライブ装置
63 USBカードリーダライタ
64 PCカード

[Drawing 10]

本発明の実施の形態のインターフェイス装置の構成図（2）

10 ホストコンピュータ
11, 21 IEEE1394ポート
12, 22 IEEE1394
20 インターフェイス装置
23 コントローラ
24 ATAバス
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード

[Drawing 11]

30

31

CS0-
CS1-
DIOR-
DIOW-
DASP-
CSEL
INTRQ
RESET-
DMACK-
DMARQ
DA0-DA2
DD0-DD15

CS0-
CS1-
DIOR-
DIOW-
DASP-
CSEL
INTRQ
RESET-
DMACK-
DMARQ
SELATA-
M/S-
DA0-DA2
DD0-DD15
Vcc

25

26

SELATA-

24

M/S-

23

22

21

電源
Vcc

11

12

10

10 ホストコンピュータ
11、21 SCSIポート
12、22 SCSI
20 インターフェイス装置
23 コントローラ
24 ATAバス
25 40ピンコネクタ
26 68ピンコネクタ
30 ATA／ATAPIデバイス
31 PCカード

[Drawing 12]

本発明の実施の形態のインターフェイス装置の構成図(4)

10　ホストコンピュータ
11，21　パラレルポート
12，22　パラレルインターフェイス装置
20　インターフェイス装置
23　コントローラ
24　ATAバス
25　40ピンコネクタ
26　68ピンコネクタ
30　ATA／ATAPIデバイス
31　PCカード
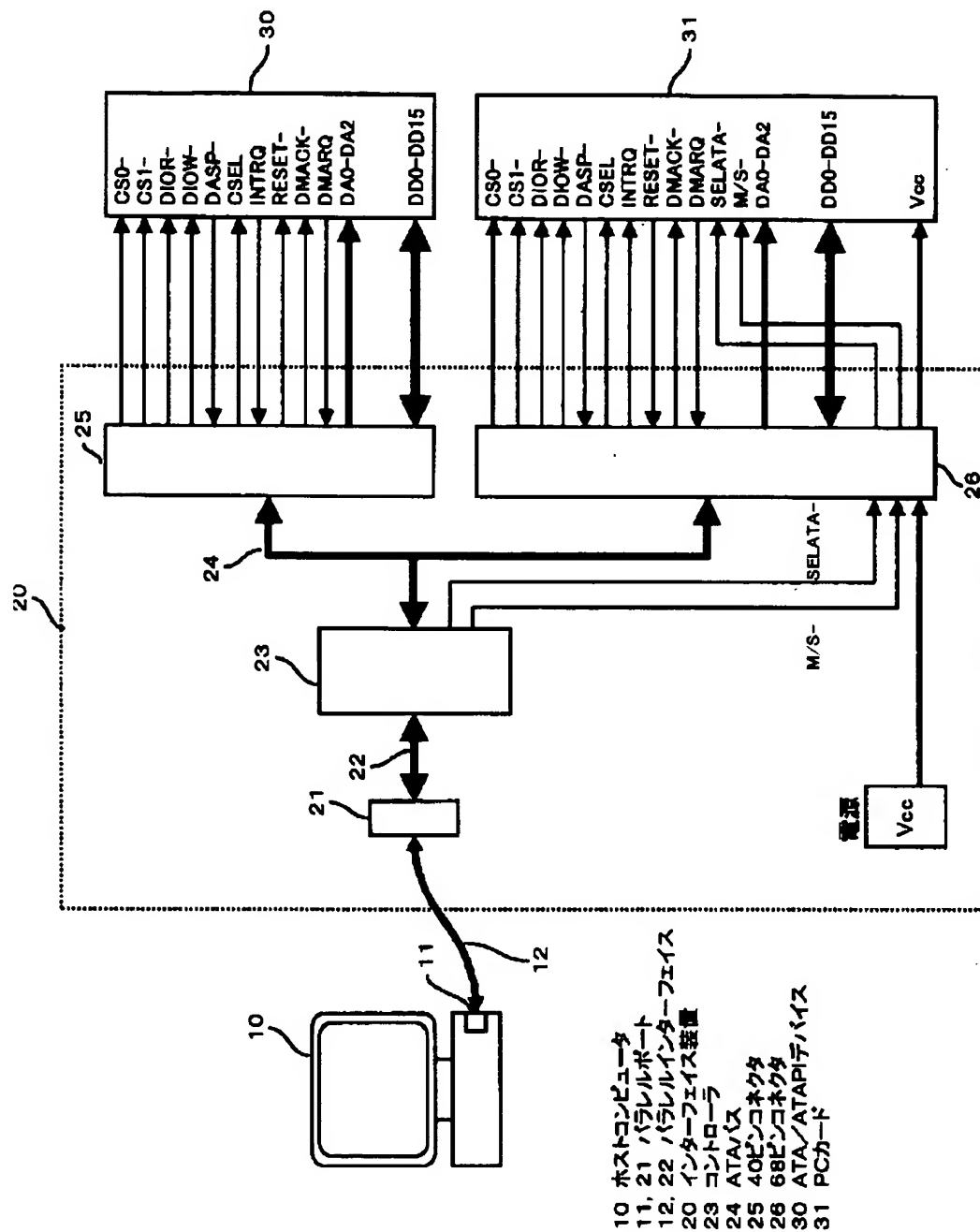
[Drawing 13]

本発明の実施の形態のインターフェイス装置の構成図(5)

30

CS0−
CS1−
DIOR−
DIOW−
DASP−
CSEL
INTRQ
RESET−
DMACK−
DMARQ
DA0−DA2
DD0−DD15

31

CS0−
CS1−
DIOR−
DIOW−
DASP−
CSEL
INTRQ
RESET−
DMACK−
DMARQ
SELATA−
M/S−
DA0−DA2
DD0−DD15
Vcc

20

25

26

24

23

22

21

SELATA−

M/S−

電源 Vcc

電源 Vcc

11

12

10

10 ホストコンピュータ
11, 21 USBポート
12, 22 USB
20 インターフェイス装置
23 コントローラ
24 ATAバス
25 44ピンコネクタ
26 50ピンコネクタ
30 ATA/ATAPIデバイス
31 PCカード

[Translation done.]